

other countries, effective measures ought to be taken for its thorough investigation.

THE British Medical Association meets at Bath from August 6 to 9.

NEAR Pombonne (France) the incisor of a mastodon has just been discovered in a sand-pit at a depth of about a metre. It measures 2.95 metres in length, its base is 45 centimetres in diameter, and the whole weighs some 250 kilogrammes. The ivory at the point is particularly well preserved.

THE General Meeting of the German Anthropological Society will take place at Kiel on August 12-14. Prof. Fraas, of Stuttgart, will speak on the drawing-up of a prehistoric map of Germany; Prof. Virchow, of Berlin, on the statistics of the shapes of skulls in Germany; and Prof. Schaaffhausen, of Bonn, on the compilation of a general catalogue of all the anthropological material in Germany.

THE Geologists' Association have arranged for an excursion to the Boulonnais on August 5, and five following days, which, judging from the admirable programme, promises both pleasure and profit to those who join it.

DR. SCHLIEMANN is at Constantinople, and intends resuming his excavations in the Troad if he can obtain from the Porte fifty soldiers as a guard against robbers. From Berlin it is stated that a summary account of the German excavations at Olympia says that the number of marble objects found during the last three winters is 904; of bronzes, 3,734; of terra cottas, 904; of inscriptions, 429; and of coins, 1,270. All the more important ruins have been photographed, and the third volume of the official account is about to appear. An exhibition of all the casts taken will shortly be opened at Berlin.

THE Jardin d'Acclimatation of Paris offers, during the present year, numerous opportunities for ethnological study. The latest arrival is a party of Guachos from the Pampas of South America, consisting of six men, three women, and a child. They are accompanied by a complete collection of the animals of the Argentine Republic, and by seventeen wild horses. The capture of the horses at full gallop with the lasso forms their chief exhibition.

A SECOND edition of Hooker's standard "Student's Flora of the British Islands," has just been published by Macmillan and Co.; several emendations have been introduced.

WE alluded recently to the remarkable record of earthquakes preserved through so many centuries in Japan. Mr. Hattori, of Tokio, has lately described an ingenious seismograph, which was invented by one Choko, 1,750 years ago. It consisted of a cylinder 8 feet in height, ornamented by various characters and designs. The upper part was encircled by a series of eight dragon's heads, in the open mouth of each of which, a copper ball was lightly balanced. The interior of the cylinder was occupied by a system of rods and springs, so delicately joined that the slightest trembling of the earth would serve to push a ball from a dragon's mouth. Immediately below each dragon's head was a frog looking upward, with his mouth likewise wide open, to receive the balls. The sound of the falling ball would call attention to the phenomenon, and the direction of the earthquake would be revealed by the particular ball dropped. This seismograph correctly recorded earthquakes, which were felt strongly at a distance, but were too feeble to be noticed by the senses in the immediate vicinity.

THE African traveller, Hildebrandt, recommends strongly, in the *Korrespondenzblatt der afrik. Gesellschaft*, the use of petroleum for those travelling in the tropics, as a protection against insects. Occasional applications to the face and hands ensured entire freedom from mosquitoes, and the same method sufficed to

preserve horses and cattle against the deadly attack of the Dondorobo gadfly, which so often cripples the movements of the explorer. Petroleum, likewise, protected the natural history collections of the traveller from ants, moths, &c.

THE contributors to the *Zeitschrift für wissenschaftliche Zoologie* have just completed the issue of a supplemental volume of 634 pages, following on their thirtieth volume, as a testimonial offering to Carl Theodor von Siebold on the fiftieth anniversary of his doctorate, April 22, 1878. Prof. von Siebold was for long the chief conductor of this most important journal, having now associated with him as active editor Prof. Ehlers. The festival volume is remarkable for the number and eminence of the contributors, and the importance of their contributions. There are more than twenty authors, including Haeckel, R. Leuckart, Ehlers, Oscar Schmidt, von Thering, Forel, Stiel, Weismann, Simroth, F. Leydig, Salensky, Carl Vogt, Möbius, Repiachoff, and L. Graff. Leydig on the Amphipods and Isopods, Möbius on the movements of flying fish through the air, Haeckel on the phylogeny of the Echinoderms, Flögel on the brains of insects, may be mentioned as memoirs of the most valuable kind.

MESSRS. LONGMANS have sent us vol. iv. of "Ure's Dictionary of Arts, Manufactures, and Mines," edited by Mr. Robert Hunt, F.R.S. This volume is supplementary to the preceding three, and it is apparent that an earnest attempt has been made to record all additions, improvements, and new applications of value.

WE have received from Messrs. Maclure and Macdonald the first four parts of a beautifully and faithfully executed series of Portraits of Distinguished Men, among which are the portraits of several men of science—Sir Joseph Hooker, Prof. Owen, Dr. Allen Thomson. The future parts will contain other portraits of men well known in the scientific world. Each portrait is accompanied by a suitable notice, and the work as a whole deserves hearty encouragement.

THE additions to the Zoological Society's Gardens during the past week include two Macaque Monkeys (*Macacus cynomolgus*) from India, presented by Dr. Adcock; a Burrowing Owl (*Speotyto cunicularia*) from America, presented by Dr. Geo. E. P. Nixon; a Green-winged Dove (*Chalcophaps indica*) from India, presented by Capt. Otho N. Shaw; six Common Guillemots (*Uria troile*), British Isles, presented by Sir Hew. Dalrymple, Bart.; a Common Nightingale (*Daulias luscintia*), European, presented by Mr. Gee; five Great Bustards (*Obis tarda*), a European Bearded Vulture (*Gypaëtus barbatus*), a Spanish Imperial Eagle (*Aquila adalberti*), a Bonelli's Eagle (*Nisaëtus fasciatus*), a Booted Eagle (*Nisaëtus pennatus*), two Lanner Falcons (*Falco lanarius*) from Southern Spain, a Red and Blue Macaw (*Ara macao*), a Blue and Yellow Macaw (*Ara ararauna*) from South America, deposited; an Orang-utang (*Simia satyrus*) from Borneo, a Coati (*Nasua nasica*) from South America, two American Flying Squirrels (*Sciuropterus volucella*) from North America, received in exchange.

#### THE MOVEMENTS OF FLYING FISH THROUGH THE AIR

THESE movements form the subject of an interesting paper recently contributed by Prof. Möbius to the *Zeitschrift für wissenschaftliche Zoologie* (Band xxx., suppl., p. 343; see *Naturforscher*, June 8, 1878). From his own observations (made during a voyage to Mauritius, *via* Suez, and back by the Seychelles) and the observations of others, he describes the principal features of the phenomenon thus:—

The exoceti dart with great velocity out of the water without regard to the direction of the wind and the course of the waves.

They do not, during their flight, make any regular fluttering

movements with their pectoral and ventral fins, but hold them spread out. In the outspread fins there may occur very rapid vibrations.

The hinder part of the body remains somewhat lower than the fore part during flight.

Directly against the wind they commonly fly further than with the wind, or when their course and the direction of the wind form an angle together.

Most exocoeti which fly against the wind or with the wind continue during their whole course of flight in the direction in which they come out of the water. Winds coming laterally upon the original course of the exocoeti deflect these into their direction.

All exocoeti which withdraw from ships fly during their whole course through the air, near the surface of the water.

When with strong winds they fly against the course of the waves, they commonly rise somewhat over each wave; sometimes their tail dips slightly in the top of the wave.

Only those exocoeti whose air-course is crossed by a ship rise to considerable heights (at the most about five metres above the surface of the sea).

By day flying fish seldom light on the ship; they mostly do so at night, and never in calm, but only when the wind is blowing. They mostly fall upon ships which lie not higher than two to three metres above water, and when these are sailing on a wind (the wind coming obliquely from beyond) or with half a wind (the wind coming at right angles against the ship), and are sailing rapidly. Flying fish never come on board from the lee side, but always and only from the weather side.

Not uncommonly when their tail has dipped in the water they describe in the horizontal part of their course, a bow to the right or to the left side.

During wind and a rough sea they appear above the water more frequently than in calm weather.

Before ships, which come upon them in swimming, the exocoeti escape into the air, just as they do before fishes of prey and cetacea.

Many authors have affirmed, in explaining the flying of fish, that the pectoral fins operate like the wings of birds, bats, and of insects. Prof. Möbius, however, shows that both the anatomical structures of the pectoral fins and their muscles, and the physiological relations of the position and size of the fins to the volume and weight of the whole body, are against flight-like movements of the pectoral fins.

The movements occasionally observed in these organs during flight are merely a vibration.

The true cause of these movements of fishes through the air are the spring-movements which they impart to their body by means of their very strong side muscles, just as other fish propel themselves powerfully through water. They spring out of the water with great velocity, because the air presents less resistance than the water, and when after some time, they fall back into the water, their outspread fins act like a parachute.

It is easy to understand how the action of the wind combines favourably or otherwise with their flight. By day the direction of their spring is so chosen that the disturbing ship is avoided. By night this orientation by the sense of sight is wanting, and the animals fall into the ship. As any air in strong motion, when it impinges against obstacles (a ship's side or waves), rises, it raises also the fish, so that this flies over the wave, or may come on board the ship. In short, as Prof. Möbius proves in detail, all the phenomena observed may be fully explained by the combined action of the oblique projection forwards and the wind. It may further be mentioned that the flying fish has a peculiar arrangement of the mouth, so that in this a portion of water may be carried during flight for the process of respiration.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE

THE Kingdom of Portugal has for its 4,700,000 inhabitants but a single university—that of Coimbra, which was originally founded at Lisbon in 1290. The university has a corps of instructors numbering 70, is attended by 1,100 students, possesses a library of 42,000 volumes, and is equipped with astronomical and meteorological observatories, as well as natural history collections. Advanced education is likewise provided for by polytechnics, medical academies, and industrial institutes in Lisbon and Oporto, and an agricultural school. The elementary schools of the land number 2,450, and parents lose their

political rights if their children cannot read and write at the age of 15.

THE University of Strasburg is attended at present by the largest number of students recorded since its establishment, viz., 710, consisting of 45 in theology, 195 in law, 150 in medicine, 177 in philosophy, and 143 in science.

THE new regulations for medical study in France require a term of four years, five examinations, including one in physics, chemistry, and natural history, practical work in the laboratories and anatomical theatre, and two years visiting of the hospitals. The sum requisite for this course of study is 1,360 francs—520 for lectures, and the remainder for examination fees, thesis, and diploma.

AN examination will begin at Merton College, Oxford, on Tuesday, October 15, for the purpose of electing to a Physical Science Postmastership of the annual value of 80*l.*, and tenable for five years from election. After two years of residence the College will raise, by a sum not exceeding 20*l.* per annum, the postmasterships of such postmasters as shall be recommended by the tutors for their character, industry, and ability. Candidates, if members of the University, must not have exceeded six terms of University standing. Information may be obtained from the tutor in physical science.

MR. SAMUEL SHARPE has promised to give 5,000*l.* towards the building of the north wing of University College, London, so soon as the Council are prepared to begin the work. It is expected that this liberal donation, together with others which have been received, will enable the building to be very shortly commenced. A sum of 50,000*l.* in all will, however, be required to complete the extensions which are immediately contemplated.

### SOCIETIES AND ACADEMIES

#### LONDON

Anthropological Institute, June 25.—Mr. John Evans, D.C.L., F.R.S., president, in the chair.—Dr. Paul Topinard, of Paris, was elected an Honorary Member, and the election of the following gentlemen as Ordinary Members was announced:—The Rev. H. W. Watkins, Warden of St. Augustine's College, Canterbury; Hy. Wm. Jackson, M.R.C.S., F.R.A.S., F.G.S., of Lewisham, and Dr. Dunkley, of New Zealand.—A paper was read on the ethnology of the islands of the Pacific, by the Rev. S. J. Whitmee. This paper was chiefly intended to explain an ethnographic chart of the Pacific, coloured according to the author's own observations, and which, in the main, followed the divisions of races in previous charts. In speaking of the people, he said the Melaneseans, or black race, might be regarded as the aboriginal people, and that they had affinities, more or less remote, with the blacks found in the various parts of the southern hemisphere. Probably these Melaneseans once extended further across the Pacific than they now do. The brown Malayo-Polynesian race had, doubtless, entered Polynesia from the west. The difficulties of such a migration were not insuperable. An example was given of a comparatively recent arrival of a vessel thought to be Chinese or Japanese, at Fotuna, or Home Island, containing forty people. There is a third people in Polynesia differing considerably from both of the others. These are the Micronesians. They probably are primarily from the Philippines, or some other portion of the Indian Archipelago, but are mixed with Melanesian and Malayo-Polynesian blood. There is also reason to believe they have had an admixture of Chinese or Japanese blood derived from the occupants of junks which have been driven by adverse winds to this region.—Mr. Worthington G. Smith read a paper descriptive of palæolithic implements from the gravels of N.E. London, and a paper was communicated by Mr. G. M. Atkinson on a new method of finding the cephalic index.

Entomological Society, July 3.—H. W. Bates, F.L.S., F.Z.S., president, in the chair.—Mr. Basil G. Nevins was elected an Ordinary Member and Mr. John A. Finzi a Subscriber.—Mr. Pascoe exhibited a number of insects he had collected during a recent tour through Algeria and the south of Spain; with these there was a remarkable myriopod having the cylindrical body of the Julidae, but with only one pair of legs to each somite.—Mr. Boyd drew attention to the food plant of *Eluchista cerusella*. This insect had always been considered to feed on the leaves of *Arundo phragmites*, which Mr. Boyd doubted, as he had lately found the larva feeding on *Phalaris arundinacea*.